

REMARKS

The application has been reviewed in light of the final Office Action dated January 6, 2010.

Claims 57-100 were pending for examination on the merits in this application, of which only claims 57 and 79 are in independent form. Claims 1-56 and 101-122 were withdrawn by the Patent Office from examination.

The only independent claims have been amended by including therein subject matter related to their respective dependent claims 58 and 80, which also have been amended hereby.

Record of Telephone Interview

Applicants appreciate the telephone interview that Examiner Ellsworth Weatherby and his supervisory Examiner granted to the undersigned applicants' representative on March 4, 2010. The representative discussed claims 57 and 79 amended as set out above in the Listing of Claims, and the primary reference, Eberhard et al. U.S. Patent 6,751,285.

Applicants' representative argued that while the Eberhard et al. reference discusses a tomosynthesis system, it does not teach a system in which (i) the x-ray source applies an x-ray dose to the patient's breast in each of said tomosynthesis positions that is less than the x-ray dose applied to the breast in said mammogram position, and (ii) the x-ray dose for said mammogram position is similar to a dose used for a conventional mammogram. The representative also argued that the Eberhard et al. reference discusses a choice of using or not using a grid but does not teach using a grid for a mammogram image but not for at least some of the tomosynthesis projection images taken with the same system. The representative further argued the subject

matter discussed below under the heading Comment Regarding Paragraphs 20-22 of the Office Action.

Applicants' representative understood from the telephone interview that subject to further review (i) the proposed Rule 116 Amendment would be entered, (ii) the proposed amended claims 57 and 79 appear allowable over the prior art of record, and (iii) Examiner Ellsworth Weatherby would check the remaining, dependent claims for consistency with claims 57 and 79 and would consider any additional prior art that may appear of possible interest.

Comment Regarding Paragraphs 20-22 of the Office Action

The Office Action, paragraph 20 on pages 7-8, asserts that independent claims 57 and 79 and their respective dependent claims 58 and 80 do not distinguish from Eberhard because they are sufficiently broad so as not to exclude tomography passing through CC or MLO view.

Applicants submit that at least claims 58 and 80 did distinguish from Eberhard in this respect by reciting that the x-ray dose is greater for the mammogram position than for the tomosynthesis positions. This ties the x-ray dose to imaging position while in Eberhard the only mention of dose differences pertains to breast thickness, not to imaging position. The amendment moves the concept of dose difference between imaging at mammogram and at tomosynthesis positions into independent claim 57 by reciting therein that

the x-ray dose to the patient's breast when taking said image data for each of said tomosynthesis positions is less than the x-ray dose when taking said image data for said mammogram position, and the x-ray dose for said mammogram position is similar to a dose used for a conventional mammogram.

Support for this recitation is found in the combination of now canceled dependent claim 58 and the patent application, for example in the statement in paragraph 19 that

[P]referably the dose at one of the positions, e.g., at or close to the 0° position, is the same or similar to [the] dose for a conventional mammogram while the dose at each of the other positions is less, preferably much less.

In the beginning of the same paragraph 19, the patent application identifies the 0° position as being the same or similar to the CC position for a conventional mammogram.

Eberhard does not teach using a lower x-ray dose for each of the tomosynthesis imaging positions than the dose for the mammogram position, or making the dose for the mammogram position similar to that for a conventional mammogram. In Eberhard, the dose can vary but depending on the thickness of the breast rather than on imaging position, and there is no teaching of a dose for a given tomosynthesis imaging position being similar to that for a conventional mammogram. According to Eberhard, the total dose for all the imaging positions can approximate the dose for a standard mammogram, not the dose at a given imaging position.

The Office Action at page 3 refers to Eberhard col. 4, l. 47-col. 5, l. 60, but this portion of Eberhard discusses only the taking of views (tomographic projection images) at different doses depending on breast thickness, not on imaging position or angle of a view. The mention of a dose for a conventional mammogram in Eberhard is in col. 5, ll. 52-55, stating that the total dose of the tomosynthesis views can approximate the dose for a standard mammogram.

Claim 79 as amended hereby is similar in this respect, as it now recites that

said x-ray source applies an x-ray dose to the patient's breast in each of said tomosynthesis positions that is less than the x-ray dose applied to the breast in said mammogram position, and the x-ray dose for said mammogram position is similar to a dose used for a conventional mammogram.

Accordingly, applicants submit that the difference from Eberhard relating to this feature is present in the amended independent claims 57 and 79.

Applicants further submit that the amendment should be entered because it does not require a new search or substantial additional work on the part of the Office as now canceled claims 58 and 80 already recited the feature of using for the mammogram position an x-ray dose that is greater than for each of the tomosynthesis positions.

This feature of amended independent claims is particularly significant as it makes it possible to use the same equipment to take both x-ray mammograms, which radiologists have become accustomed to reading over many years of practice, and tomosynthesis projection or slice views that can provide additional information to the health professional. Moreover, both kinds of images can be taken in a single compression of the patient's breast, although in the alternative they can be taken at different compressions or times.

Claim Rejections – 35 USC § 103

In section 3 of the January 6, 2010 final Office Action, claims 57-68, 73, 79-92, 95 and 99 were rejected under 35 U.S.C. § 103(a) as purportedly unpatentable over Eberhard et al. USPN 6,751,285 ("Eberhard") in view of Tang et al. US 2003/0026386 A1 ("Tang"). In section 4 of the January 6, 2010 final Office Action, claims 70, 72 and 93-94 were rejected under 35 U.S.C. § 103(a) as purportedly unpatentable over Eberhard in view of Tang and further in view of Karellas et al. US 2003/0169847 A1 ("Karellas"). In section 8 of the January 6, 2010 final Office Action, claims 74, 75, 96 and 97 were rejected under 35 U.S.C. § 103(a) as purportedly unpatentable over Eberhard in view of Tang and further in view of Tumey et al. USPN 5,941,832 ("Tumey"). In section 12 of the January 6, 2010 final Office Action, claims 76 and 98 were rejected under 35 U.S.C. § 103(a) as purportedly unpatentable over Eberhard in view of Tang and further in view of Wang et al. US 2003/0212327 A1 ("Wang"). In section 16 of the January

6, 2010 final Office Action, claims 78 and 100 were rejected under 35 U.S.C. § 103(a) as being purportedly unpatentable over Eberhard in view of Tang and further in view of Hsieh et al. USPN 6,574,304 (“Hsieh”).

In the preceding section of these Remarks, applicants point out a patentable difference of the sole independent claims 57 and 79 from the primary reference, Eberhard. As the Office Action points out, the secondary references pertain only to other features.

Thus, Tang was cited on page 4 of the Office Action in connection with using anti-scatter grid and 35 kVp, in conjunction with Eberhard’s reference to optionally using a grid, but does not supply a teaching of the claimed feature discussed above in connection with the primary reference. The claims rejected over the combination of Eberhard and Tang are not anticipated or made obvious at least for that reason. As an additional example, the combination does not teach using a grid “for at least the mammogram position but not for at least some of the tomosynthesis position” as recited in claim 57, or a grid “being in said path [of x-rays] for the mammogram position but being out of said path for at least some of the tomosynthesis positions” as recited in claim 79, and thus in the dependent claims to which the Eberhard/Tang combination was applied.

While Eberhard mentions that a grid may or may not be used, there is no teaching that it will be used in the mammogram position but not for at least some of the tomosynthesis positions. Similarly, while a grid is discussed in Tang, this does not amount to a teaching of electing whether to use it depending on the imaging position as recited in claims 57 and 79.

Karellas was cited in connection with using x-rays in a range near 50 kVp, but the claims to which the Eberhard/Tang/Karellas combination was applied depend from claim 57 or claim 79 and are patentably different at least for the reasons discussed above.

Tumey was cited in combination with Eberhard and Tang in connection with the display of multiple mammograms. Again, its addition does not add a teaching of the features distinguishing the parent claims 57 and 79 as discussed above. In addition, the claims rejected over the Eberhard/Tang/Tumey combination recite displaying the mammogram and tomosynthesis images for concurrent viewing or on the same screen while Tumey discusses display of only mammograms and/or scintimammograms, not a display of tomosynthesis images. A significance of the claimed feature is that the radiologist can look both at the more familiar mammograms and at the tomosynthesis images that can provide more detailed information regarding breast tissue that may not be as clearly visible in the mammograms.

Wang was cited in connection with displaying ultrasound images near x-ray mammograms, but not in connection with the features discussed above that distinguish parent claims 57 and 79 from the Eberhard/Tang combination. In addition, the claims rejected over the Eberhard/Tang/Wang combination recite the display of x-ray tomosynthesis images in addition to x-ray mammograms, not the display of x-ray and ultrasound images.

Last, Hsieh was cited in connection with the acquisition and display of thick slice images (5-10 mm thick) but this pertains to CT slices acquired with an x-ray beam that irradiates such thickness of tissue, while the tomosynthesis images in claims 78 and 100 are tomosynthesis slice images, which means that a plurality of projection tomosynthesis images are computer-processed to produce an image of a slice, which slice may be at a different orientation and conform to a plane (flat or curved) different from the plane of any of the projection images. Also, again the addition of Hsieh does not add a teaching of the features of the parent claims 57 and 79 discussed above.

In view of the remarks herein above, Applicants submit that the application is allowable.

If a petition for an extension of time is required to make this response timely, this paper should be considered to be such a petition. The Patent Office is hereby authorized to charge any fees that are required in connection with this amendment and to credit any overpayment to our Deposit Account No. 03-3125.

If a telephone interview could advance the prosecution of this application, the Examiner is respectfully requested to call the undersigned attorney.

Respectfully submitted,



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